REMARKS

The amendment to the specification formally amends the specification as originally requested in the Preliminary Amendment. No new matter is believed to be added to the application by this Amendment.

Status of the Claims

Claims 1 and 3-13 are pending in the application. Support for the amendments to claims 1 and 9 can be found at page 9, lines 1-4 and at page 24, lines 13-14 of the specification. Claim 10 is supported by claims 1, 3, 5 and 6. Support for new claims 11-13 can be found at page 24, lines 13-14 of the specification.

Rejection Under 35 U.S.C. 103(a) Over EP '121, Sadatoshi, Yamamoto or JP '656 (Paragraphs 2-3 of the Office Action)

Claims 1, 3-5 and 7-9 are rejected under 35 U.S.C. 103(a) as being obvious over EP '121 (EP 716121) in view of Sadatoshi (U.S. Patent No. 5,340,878) and either Yamamoto (U.S. Patent No. 5,656,696) over JP '656 (JP 54120656). Applicants traverse.

The Present Invention and Its Advantages

The present invention pertains to a propylene/1-butene copolymer composition for an extrusion coating. The claimed

composition for an extrusion coating exhibits excellent low-temperature properties and hot tack.

As set forth in instant claim 1, the propylene/1-butene random copolymer composition has 50 to 95% by weight of a propylene/1-butene random copolymer (A) and 5 to 50% by weight of a low-density polyethylene (B).

The properties of the propylene/1-butene random copolymer (A) include: (1) 60-90 mol% of structural units derived from propylene and 10-40 mol% of structural units derived from 1-butene; (2) a melt flow rate measured at 230°C under a load of 2.16 kg in accordance with ASTM D 1238 of 0.1 to 40 g/10 min; (3) a molecular weight distribution (Mw/Mn), measured by gel permeation chromatography (GPC), of up to 3; (4) a B-value, being a parameter indicating a randomness of copolymer monomer chain distribution, of 1.0 to 1.3; (5) a melting point Tm, measured by a differential scanning calorimeter, of 60 to 140°C (the melting point, Tm, and a content of 1-butene structural units, M (mol%), satisfying the relationship: $-2.6\ M + 130 \leq Tm \leq -2.3\ M + 155$); and (6) a crystallinity measured by X-ray diffraction, C(%), and the content of 1-butene structural units, M (mol%), satisfying the relationship: $C \geq -1.5\ M + 75$.

The low-density polyethylene (B) has the following properties: (1) a melt flow rate measured at 190°C under a load of 2.16 kg in

accordance with ASTM D 1238 of 1 to 25 g/10 min; and (2) a density of 0.915-0.935 g/cm^3.

Distinctions of the Invention Over EP '121, Sadatoshi, Yamamoto and JP '656.

Distinctions of the invention over EP '121, Sadatoshi and Yamamoto are of record in the application. EP '121 fails to disclose the melt flow rate of propylene/1-butene copolymer. Sadatoshi pertains to a fundamentally different polymer than the metallocene-catalyzed copolymer (A) of the invention. Yamamoto pertains to an α-olefin having four or more carbon atoms, while the present invention pertains to a three-carbon α-olefin.

Further, Yamamoto pertains to a resin composition for injection molding. However, the instantly claimed composition is for extrusion coating. As a result, Yamamoto pertains to a fundamentally different field than the invention.

Also, at page 14, line 4 of the Office Action, the Examiner asserts that there is only a "slight" difference between the amount of polyethylene disclosed by Sadatoshi and the amount disclosed in the claimed invention. However, the claims have been amended so as to demonstrate that there is a substantial difference between the amount of polyethylene disclosed by Sadatoshi and the amount of polyethylene being claimed by the invention.

JP '656, newly cited by the Examiner, pertains to polymer compositions for lamination comprising (a) propylene/1-butene

random copolymer having a melt index of 0.1-40g/10 min and (b) low-density polyethylene. Some of the properties of the JP '656 compositions, e.g., melt flow rate, can be compared to those of the invention.

However, similar to Sadatoshi, the propylene/1-butene random copolymer of JP '656 is prepared using a Ziegler-Natta catalyst of complexes containing at least magnesium, titanium and halogen, organometallic compounds with metals in Group I-III of the Periodic Table and electron donors. See page 4, lines 21-24 of JP '656 (English translation).

The fundamental differences in catalysis yield fundamentally different properties.

In this connection, as shown in Application Example 1 of JP '656, the copolymer has a propylene content of 81 mol% (1-butene content:19 mol%) and a melting point of 125°C (see page 8, lines 14-15 of JP '656 (English translation). This copolymer fails to satisfy the claimed relationship: $-2.6\ M + 130 \leqq Tm \leqq -2.3\ M + 155$, as calculated below.

$$-2.6\ (19) + 130 \leqq 125°C \leqq -2.3(19) + 155$$

$$80.6 \leqq 125°C \leqq 111.3$$

Thus, the propylene/1-butene random copolymer of the claimed invention and that of JP '656 clearly have fundamentally different properties.

As a result, there is no teaching or suggestion in JP '656 that addresses the deficiencies of EP '121, Sadatoshi and Yamamoto in suggesting an instantly claimed embodiment of the invention. Thus, a *prima facie* case of obviousness has not been made over EP '121, Sadatoshi, Yamamoto or JP '656. Further, any obviousness that can be alleged are overcome by the advantageous properties of the extruded composite film of the invention for haze, gloss and slip properties. Accordingly, this rejection is overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. §103(a) Over EP'121 In View Of Sadatoshi and Yamamoto or JP '656, and Further In View Of Yoshimura (paragraph 4 of the Office Action)

Claim 6 is rejected under 35 U.S.C. §103(a) over EP'121 in view Of Sadatoshi, Yamamoto, or JP '656, and further in view of Yoshimura (U.S. Patent 5,443,765). Applicants traverse this rejection and respectfully request reconsideration and withdrawal thereof.

Yoshimura fails to address the inability of the combination of EP '121, Sadatoshi, Yamamoto or JP '656 to suggest a claimed embodiment of the invention.

In rejecting claim 6, the Examiner turns to Yoshimura for examples of C_{3-12} α-olefins. See, e.g., Yoshimura at column 12, lines 10-12. However, these teachings fail to address the non-combinability of EP '121, Sadatoshi and Yamamoto or JP '656. Even

if this prior art were combinable, Yoshimura at column 12, lines 10-12 only teaches a limited range of examples, such as propylene, butene, pentene, hexene, heptene, octene and 4-methyl-1-pentene.

Thus, a *prima facie* case of obviousness has not been made over the combination of the four references of EP '121, Sadatoshi, Yamamoto, JP '656 and Yoshimura. Accordingly, this rejection is overcome and withdrawal thereof is indicated.

Rejection Under 35 U.S.C. §103(a) Over Sugano, EP'121, Yamamoto or JP '656 (paragraph 5 of the Office Action)

Claims 1-3, 5 and 7-8 are rejected under 35 U.S.C. §103(a) over Sugano (U.S. Patent 5,468,781) in view of EP'121, Yamamoto, or JP '656. Applicants traverse this rejection and respectfully request reconsideration and withdrawal thereof.

Sugano pertains to polypropylene expanded particles. At column 5, lines 8-9, Sugano discusses "propylene-1-butene random copolymers of a butene-1 content of 0.1 to 25%," which the Examiner asserts encompasses the composition ranges of the invention.

The Examiner admits that Sugano fails to disclose molecular weight distributions, B value, melting point, crystallinity of propylene/1-butene copolymer, density, melt flow rate and filler.

The Examiner turns to EP '121 and Yamamoto or JP '656 to address the deficiencies of Sugano in suggesting the claimed invention. However, the additional deficiencies of EP '121 and

Yamamoto or JP '656 in suggesting a claimed embodiment of the invention, discussed in detail above, are not alleviated by combination with Sugano. That is, Yamamoto is still from non-analogous art (injection molding) that fails to be applicable to a laminate adhesive. Also, EP '121 fails to disclose the melt flow rate of propylene/1-butene copolymer.

Although the Examiner may turn to newly cited JP '656 for propylene/1-butene compositions, this reference fails to satisfy the mathematical relationship for Tm, as was discussed above.

As has been shown, with the combination of Sugano, EP '121 and Yamamoto or JP '656 would fail to motivate a person having ordinary skill in the art to produce a claimed embodiment of the invention. Thus, a *prima facie* case of obviousness has not been made. Accordingly, this rejection is overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. §103(a) Over Sugano, EP'121 And Yamamoto or JP '656, and Further In View Of Yoshimura (paragraph 6 of the Office Action)

Claim 6 is rejected under 35 U.S.C. §103(a) over Sugano in view of EP'121, Yamamoto or JP '656, as applied in paragraph 5 of the Office Action, and further in view of Yoshimura. Applicants traverse this rejection and respectfully request reconsideration and withdrawal thereof.

Yoshimura fails to address the inability of the combination of Sugano, EP '121, Yamamoto or JP '656 to suggest a claimed embodiment of the invention.

In rejecting claim 6, the Examiner turns to Yoshimura for examples of C_{3-12} α-olefins. See, e.g., Yoshimura at column 12, lines 10-12. However, these teachings fail to address the non-combinability of Sugano, EP '121, Yamamoto or JP '656. Even if this prior art were combinable, Yoshimura at column 12, lines 10-12 only teaches a limited range of examples, such as propylene, butene, pentene, hexene, heptene, octene and 4-methyl-1-pentene.

Thus, a *prima facie* case of obviousness has not been made over the combination of Sugano, EP '121, Yamamoto, JP '656 and Yoshimura. Accordingly, this rejection is overcome and withdrawal thereof is indicated.

Rejection Under 35 U.S.C. 103(a) Over JP '656 In View of EP '121 (Paragraph 7 of the Office Action)

Claims 1, 4-5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '656 in view of EP '121. Applicants traverse.

The deficiencies of JP '656 and EP '121 in suggesting an embodiment of the invention has been discussed above. JP '656 pertains to a propylene/1-butene random copolymer produced using a Ziegler-Natta type catalyst and further produces a polymer that

does not satisfy the claimed mathematical relationship for Tm. EP '121, which fails to disclose or suggest a melt flow rate of the invention, fails to address the deficiencies of JP '656. As a result, a person having ordinary skill in the art would not be motivated by the combination of JP '656 and EP '121 to produce a claimed embodiment of the invention. Thus, a *prima facie* case of obviousness has not been made over JP '656 and EP '121.

Accordingly, this rejection is overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. 103(a) Over JP '656 In View of EP '121 and Further in View of Yoshimura (Paragraph 8 of the Office Action)

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '656 in view of EP '121 as applied to claims 1-2, 4-5 and 7-9, and further in view of Yoshimura. Applicants traverse.

Yoshimura fails to address the inability of the combination of JP '656 and EP '121 to suggest a claimed embodiment of the invention.

In rejecting claim 6, the Examiner turns to Yoshimura for examples of C_{3-12} α-olefins. See e.g., Yoshimura column 12, lines 10-12. However, these teachings fail to address the non-compliability of JP '656 and EP '121. Thus, a *prima facie* case of obviousness has not been made.

Accordingly, this rejection is overcome and withdrawal thereof is respectfully requested.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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MSW/REG:jls
1155-0215P

Attachment: Version with Markings to Show Changes Made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraph beginning on page 10, line 24, has been amended as follows:

When the melting point of the propylene/1-butene random copolymer exceeds 140°C, the suitable film heat sealing temperature becomes as high as 130°C or above. On the other hand, when the melting temperature is lower than 60°C, the scratch resistance deteriorates although the low-temperature heat sealing properties are improved and, further, film blocking may occur during the storage, thereby rendering [the] practical use difficult.

IN THE CLAIMS:

The claims have been amended as follows:

1.(Twice Amended) A propylene/1-butene random copolymer composition comprising 50 to [96%] 95% by weight of a propylene/1-butene random copolymer (A) and [4] 5 to 50% by weight of a low-density polyethylene (B), the composition being for an extrusion coating,

said propylene/1-butene random copolymer (A):

(1) comprising 60-90 mol% of structural units derived from propylene and 10-40 mol% of structural units derived from 1-butene;

(2) exhibiting a melt flow rate measured at 230°C under a load of 2.16 kg in accordance with ASTM D 1238 of 0.1 to 40 g/10 min;

(3) having a molecular weight distribution (Mw/Mn), measured by gel permeation chromatography (GPC), of up to 3;

(4) having a B-value, being a parameter indicating a randomness of copolymer monomer chain distribution, of 1.0 to 1.3;

(5) has a melting point Tm, measured by a differential scanning calorimeter, of 60 to 140°C,

said melting point, Tm, and a content of 1-butene structural units, M (mol%), satisfying the relationship:

$-2.6\ M + 130 \leq Tm \leq -2.3\ M + 155$; and

(6) has a crystallinity measured by X-ray diffractometry, C(%), said crystallinity and the content of 1-butene structural units, M (mol%), satisfying the relationship:

$C \geq -1.5\ M + 75$, and

said low-density polyethylene (B):

(1) exhibiting a melt flow rate measured at 190°C under a load of 2.16 kg in accordance with ASTM D 1238 of 1 to 25 g/10 min; and

(2) having a density of 0.915-0.935 g/cm^3.

6. (Amended) The propylene/1-butene random copolymer composition as claimed in claim 5, wherein the α-olefin is at least one selected from the group consisting of propylene, 1-butene, 1-pentene, 2-methyl-1-butene, 3-methyl-1-butene, 1-hexene, 3-methyl-1-pentene, 4-methyl-1-pentene, 3,3-dimethyl-1-butene, 1-heptene, methyl-1-hexene, dimethyl-1-pentene, trimethyl-1-butene, ethyl-1-pentene, 1-octene, methyl-1-pentene, dimethyl-1-hexene, trimethyl-1-pentene, ethyl-1-hexene, methylethyl-1-pentene, [diethy-1-butene] diethyl-1-butene, propyl-1-pentene, 1-decene, methyl-1-nonene, dimethyl-1-octene, trimethyl-1-heptene, ethyl-1-octene, methylethyl-1-heptene, diethyl-1-hexene, 1-dodecene and 1-hexadodecene.

9. (Amended) A propylene/1-butene random copolymer composition comprising 50 to [96%] 95% by weight of a propylene/1-butene random copolymer (A) and [4] 5 to 50% by weight of a low-density polyethylene (B), the composition being for an extrusion coating,

said propylene/1-butene random copolymer (A):

(1) comprising 60-90 mol% of structural units derived from propylene and 24-40 mol% of structural units derived from 1-butene;

(2) exhibiting a melt flow rate measured at 230°C under a load of 2.16 kg in accordance with ASTM D 1238 of 0.1 to 40 g/10 min;

(3) having a molecular weight distribution (Mw/Mn), measured by gel permeation chromatography (GPC), of up to 3;

(4) having a B-value, being a parameter indicating a randomness of copolymer monomer chain distribution, of 1.0 to 1.3,

(5) has a melting point Tm, measured by a differential scanning calorimeter, of 60 to 140°C,

said melting point, Tm, and a content of 1-butene structural units, M (mol%), satisfying the relationship:

$-2.6\ M + 130 \leq Tm \leq -2.3\ M + 155$; and

(6) has a crystallinity measured by X-ray diffractometry, C(%), said crystallinity and the content of 1-butene structural units, M (mol%), satisfying the relationship:

$C \geq -1.5\ M + 75$, and

said low-density polyethylene (B):

(1) exhibiting a melt flow rate measured at 190°C under a load of 2.16 kg in accordance with ASTM D 1238 of 1 to 25 g/10 min; and

(2) having a density of 0.915-0.935 g/cm^3.

Claims 10-13 have been added.